



# Verification Procedure & Results Document No.: 3167-10105 rev A

<b>Test Case ID:</b> <b>005, Ver-CG-53</b>	<b>Test Case Name:</b> <b>Virtual Mooring to approximately 200m depth</b>	<b>Test Plan Document No.:</b> <b>3167-10000</b>	<b>Test Plan Rev.:</b> <b>2-00</b>	<b>Test Date:</b>
<b>Test Director</b> (Print Name)	Signature	<b>Design Engineer</b>	Approval Signature John S. Dingess (in lieu of electronic signature)<TWR>	Date 9/29/2011
<b>Test Conductor</b> (Print Name)  <TWR>	Signature	<b>System Engineer</b>	Approval Signature Ed Dever (in lieu of electronic signature)	Date 9/30/2011
<b>Witnessed by</b> (Print name)	Signature	<b>QA/QC Engineer</b>	Approval Signature <i>George Dussault</i> (In lieu of electronic signature)	Date 10/03/2011

<b>Test Class</b>	<input checked="" type="checkbox"/> Performance	<input checked="" type="checkbox"/> Behavioral	<input type="checkbox"/> Reliability	<input type="checkbox"/> Endurance / Longevity	<input type="checkbox"/> Survivability	<input type="checkbox"/> Safety
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**Test Description**  
 In this test, the glider is commanded to interrupt the mission it is running (outbound Atlantic shelf transit) and insert a 'virtual mooring' (on-station) dive to ~200m depth. Commands will be queued, i.e. not created during an active glider communication session, but programmed to be sent at a future glider communication session.

**Requirements Addressed**  
 L4-CG-GD-RQ-96, L4-CG-GD-RQ-108, L4-CG-GD-RQ-170, L4-CG-GD-RQ-78, L4-CG-GD-RQ-79, L4-CG-GD-RQ-90, L4-CG-GD-RQ-95, L4-CG-GD-RQ-98, L4-CG-GD-RQ-99, L4-CG-GD-RQ-100, L4-CG-GD-RQ-101, L4-CG-GD-RQ-112, L4-CG-GD-RQ-113, L4-CG-GD-RQ-114, L4-CG-GD-RQ-116, L4-CG-GD-RQ-117, L4-CG-GD-RQ-119, L4-CG-GD-RQ-102, L4-CG-GD-RQ-110, L4-CG-GD-RQ-111, L4-CG-GD-RQ-179, L4-CG-GD-RQ-191, L4-CG-GD-RQ-192, 1 specification without L4 requirement (SENS-009)

<b>Test Setup</b> The glider must have arrived at a place where water depth is ~200m or greater. No error messages indicating glider failure transmitted.	<b>Test Artifacts</b> This document .sbd and .tbd files Dive depth record relevant goto_110.ma files Engineering file data Virtual Mooring dive mission file(s)
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Test Procedure				Test Results		
Step No.	Instructions	Expected Results (Accept Criteria)	Requirement ID	Test Data	Pass/Fail	Notes/Waiver No.
5.1	Upload mission files to to-glider directory on Dockserver. Transfer files to glider via "dockzr *.*" command on glider terminal. Verify receipt of files on glider. Run mission. Wait for mission to complete, and for glider to connect to Dockserver via Iridium.	The glider will retrieve and execute the queued commands to perform the virtual mooring.	L4-CG-GD-RQ-96			Mission file to be queued is for a ~200m virtual mooring to within 1 m of the seafloor.
5.2	Manually set time on Glider and Science computers to incorrect time. Obtain GPS time, then command sync_time to synchronize Glider and Science time to GPS time. Verify time on both glider and science computers is now correct.	Glider will obtain GPS time upon surfacing	L4-CG-GD-RQ-108			
5.3	See Above	The science controller will synchronize to the GPS.	L4-CG-GD-RQ-110			
5.4	Verify that dive depths are controllable within tolerances from dive records	The glider dive depth will be programmable to within 0.5% or +/- 1m.	L4-CG-GD-RQ-170			
5.5	Send glider new proglets.dat file with one or more installed sensors removed. Verify sensor(s) have been disabled by loading mission sci_on.mi and observing output of science sensors.	Sensors can be selectively deactivated from the land-based controller	L4-CG-GD-RQ-78			
5.6	See Above	The glider will turn sensors off and on in response to Dockserver commands received via Iridium.	L4-CG-GD-RQ-79			
5.7	Get m_coulomb_amphr_total and m_lithium_battery_relative_charge and compare to predicted results.	Estimates of the glider's remaining operational life are calculated	L4-CG-GD-RQ-90			

Test Procedure				Test Results		
Step No.	Instructions	Expected Results (Accept Criteria)	Requirement ID	Test Data	Pass/Fail	Notes/Waiver No.
		accurately from the mission planning software.				
5.8	Send new courses via the Iridium link	The glider will download and execute new courses sent via the Iridium link	L4-CG-GD-RQ-95			
5.9	Send glider new goto_110.ma file with new waypoints via Iridium, Re-read .ma files and resume mission. Verify that glider changes trajectory to new waypoint.	The glider will download and execute new sensor protocols sent via the Iridium link	L4-CG-GD-RQ-98			
5.10	Send glider new goto_110.ma file with order of waypoints re-arranged, Re-read .ma files and resume mission. Verify that glider changes trajectory to new waypoint.	The glider will change waypoint order based on Dockserver commands from shore.	L4-CG-GD-RQ-99			
5.11	Send glider new goto_110.ma file with new b_arg: when_wpt_dist, Re-read .ma files and resume mission. Verify that glider changes behavior to reflect new distance.	The glider will react appropriately to changes in waypoint tolerance.	L4-CG-GD-RQ-100			
5.12	Transfer goto_110.ma file from glider via Dockserver with zs <path/filename> command.	The glider will report route, waypoint, and navigational tolerance in response to shore query.	L4-CG-GD-RQ-101			
5.13	Observe that glider establishes link via Freewave when within range, and in absence of Freewave establishes link via Iridium.	The glider will establish a telemetry link upon surfacing.	L4-CG-GD-RQ-112			
5.14	Verify the glider establishes a telemetry link at least once a day.	The glider will establish a telemetry link at least once a day.	L4-CG-GD-RQ-113			
5.15	Send most recent .sbd and.tbd files from glider via each link at appropriate surfacings.	The glider will transmit compressed or decimated data via the telemetry link. Freewave and Iridium links must each be used to verify this requirement.	L4-CG-GD-RQ-114			
5.16	Upload new surface.ma files to glider with new surface intervals/times. Re-read .ma files and continue mission. Verify glider follows new surface schedule.	The glider offload schedule will change in response to Dockserver commands from shore.	L4-CG-GD-RQ-116			
5.17	Send new sbdlist.dat file with new decimation parameters to glider via Dockserver. Load new sbdlist.dat file with sbd load <filename> command. Verify new parameters from data analysis.	Decimation and averaging of the data will be programmable via the Iridium link.	L4-CG-GD-RQ-117			
5.18	Examine data to verify that vertical resolution is better than 1m	Measurement vertical resolution will exceed 1m.	L4-CG-GD-RQ-119			
5.19	Review data and file directory on the science and navigation Persistors.	Engineering, scientific, and navigation data will be time-stamped and recorded on the navigation and science Persistor memory cards.	L4-CG-GD-RQ-102			
5.20	Verify presence of timestamp in data files.	Glider system time will be recorded on data.	L4-CG-GD-RQ-111			
5.21	Verify presence of GPS data in data files.	Glider position will be recorded with data.	L4-CG-GD-RQ-179			
5.22	Verify presence of buoyancy engine data in data files.	Buoyancy engine state will be included in recorded engineering data.	L4-CG-GD-RQ-191			
5.23	Verify presence of vacuum data in data files.	Internal pressure state will be included in recorded engineering data.	L4-CG-GD-RQ-192			